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THE MENACE OF WHITE PINE BLISTER RUST

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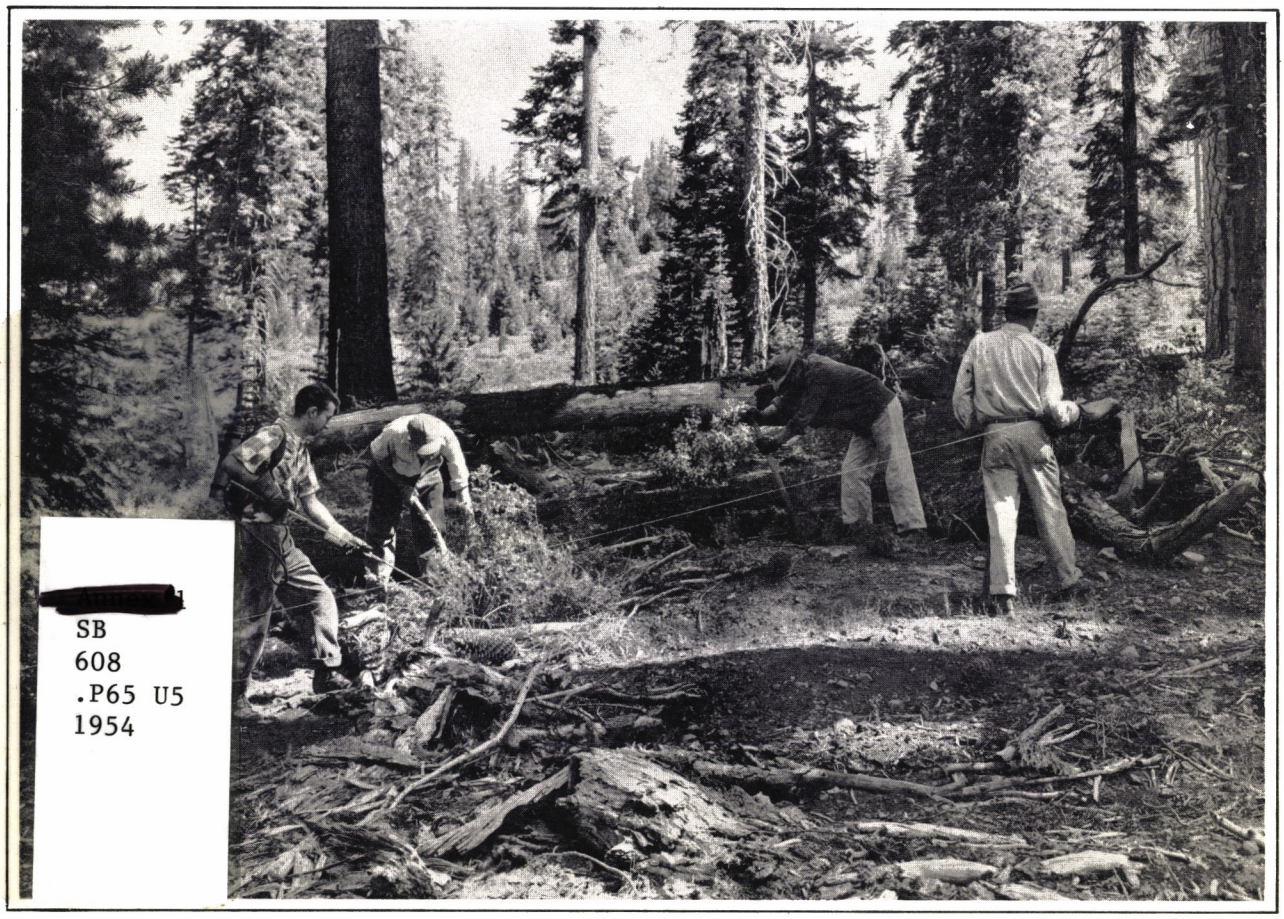
THE MENACE OF WHITE PINE BLISTER RUST



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UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE — CALIFORNIA AND OREGON

JUNE 1954

Blisters formed on the trunk of this young sugar pine have doomed it to an early death. In the springtime these blisters break open to release millions of tiny spores that will be wind-borne to spread the blister rust disease.

THE ANSWER TO THE MENACE OF WHITE PINE BLISTER RUST

Prepared by

FOREST SERVICE
630 Sansome Street
San Francisco, California

May 1954

BLISTER RUST INVADES CALIFORNIA'S FORESTS

White pine blister rust, a deadly fungous disease attacking California's sugar pine, is rapidly spreading southward in the forests of the Sierra Nevada. Brought to the West Coast from Europe in 1910, the disease soon spread eastward and southward and entered California about 1929. Although slow in its action, it is extremely destructive under favorable conditions, killing young sugar and white pines within 3 to 5 years wherever it becomes established. Unless blister rust is controlled it is not possible to produce future crops of sugar pine, where the disease becomes established. By 1953 blister rust had established itself at numerous places in northern California, and in the Sierra Nevada had reached a point 264 miles south of the Oregon line. Since blister rust first made its entrance it has intensified on sugar pine in the northern part of the state to such a degree that in a number of places outside of control unit boundaries the young pines are either dead or dying. With infection centers present at several points in the forests of the Sierra Nevada the rust is now in a position to cause serious damage to our most valuable commercial and recreational stands of sugar pine.

BLISTER RUST THREATENS A VALUABLE TIMBER RESOURCE

What does this mean in terms of our forest resources? It means that in addition to the hazards of fire and bark beetles, the commercial growing of sugar pine over large areas of its range in both California and Oregon must also face the threat of a persistently spreading plant disease. The present merchantable stand will be harvested before it is destroyed by the blister rust, but eventually this disease, uncontrolled, will make it impossible for young trees to reach maturity. Sugar pine would then disappear as an important constituent of the magnificient coniferous forest of the western slope of the Sierra and the southern Cascades.

SUGAR PINE IS A WOOD OF PREMIUM QUALITY

Ever since the West was settled, sugar pine has been noted and prized for yielding a wood of superior quality for many uses. The qualities of softness, even texture, straight grain, workability, small shrinkage, and durability, which once made the wood sought after for the pioneer cabin and the homestead, now adapt it to pattern making, stair and cabinet work, drainboards, match stock, wood carving, exterior and interior trim, and specialized uses of many kinds, especially the manufacture of doors and window sash and frames. The particular fitness of sugar pine for the making of patterns for castings, adapt it to this important industrial use.

experimentally in 1946 and has now expanded until 48% of all ribes eradication work was done by contractors during the 1953 season. Specifications for the work have been drawn, and inspection methods and procedures have been devised to insure compliance with the terms of the contracts. Procedures for training and instructing inexperienced contractors in the technique of ribes eradication have been involved.

The young sugar pines shown here are the result of natural reproduction following logging of this area. Seed trees scattered over the area are visible.

OBJECTIVES OF CONTROL WORK

The objective of control work is to protect present and future stands of white pines from blister rust. Of course, this must be done at a cost commensurate with the values being protected. On areas where timber production is the principal objective, the future value of stands of young sugar pine trees is determined and is compared with the cost of blister rust control. Work is initiated only on those areas where the ultimate value of the sugar pine crop exceeds the cost of controlling the disease. In parks and recreational areas blister rust

ANSWERS TO QUESTIONS ON WHITE PINE BLISTER RUST
AND ITS CONTROL IN THE PACIFIC COAST AREA

1. Q. WHAT IS WHITE PINE BLISTER RUST?

   A. It is a fungous plant parasite (disease) that attacks the white, or five-needled pines. It spreads on alternate host plants, from pine to currant or gooseberry bush, then back to pine. Currant and gooseberry bushes are known in blister rust control work by the general botanical term, "ribes" (pronounced rye bees).

2. Q. DOES THE DISEASE ATTACK OTHER PLANTS?

   A. No. It attacks only white pines and ribes.

3. Q. WHICH TREES IN CALIFORNIA AND OREGON ARE CLASSED AS WHITE PINES?

   A. Sugar pine, western white pine, white bark pine, foxtail pine, limber pine, and bristlecone pine. Of these, sugar pine and western white pine alone have high commercial value, but all have aesthetic and recreational importance.

4. Q. WHAT IS THE DISTINGUISHING CHARACTERISTIC OF THE WHITE PINES?

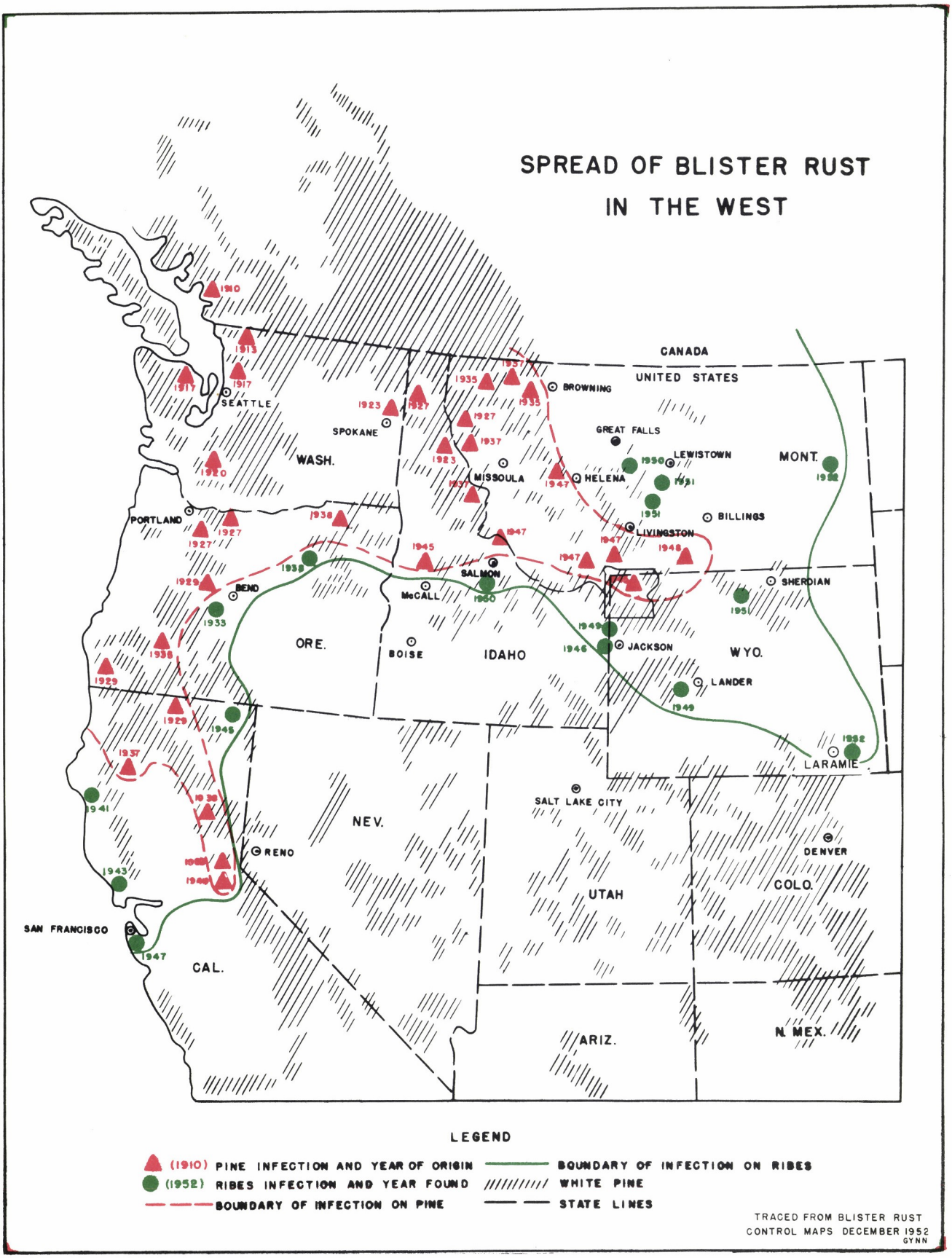
   A. White pines have five needles growing in a cluster. In contrast, the ponderosa pine has three needles, and the lodgepole pine two needles in a cluster.

5. Q. HOW DOES BLISTER RUST AFFECT THE WHITE, OR FIVE-NEEDLED, PINES?

   A. The fungus enters the pine through the needles and grows in the inner bark. From one to three years after the disease has entered a tree, it becomes visible as a reddish brown discoloration of the bark, accompanied by a slight swelling. After one or two years additional development, small whitish sacs or blisters burst through the diseased bark in the spring of each year. These sacs contain millions of tiny orange-colored spores. Spores are seed-like bodies resembling the pollen from flowers. The sacs break open in a week or two after appearing and the spores are blown by the wind. These are the spores that infect currant and gooseberry bushes. The disease portion of the bark, or "canker" as it is called, continues to enlarge and is capable of producing spores each spring until the tree has been killed by the girdling action of the disease.

6. Q. ARE THE TREES KILLED QUICKLY?

   A. The smaller the tree the more quickly it is killed. Seedlings may be killed in a year or so; large trees may linger on for many years.


SPREAD OF BLISTER RUST
IN THE WEST
CANADA
UNITED STATES
WASH.
ORE.
CAL.
IDAHO
NEV.
MONT.
WYO.
COLO.
UTAH
ARIZ.
N. MEX.
SEATTLE
SPOKANE
PORTLAND
BEND
BOISE
McCALL
SALMON
MISSOULA
BROWNING
GREAT FALLS
HELENA
LEWISTOWN
BILLINGS
LIVINGSTON
SHERIDAN
JACKSON
LANDER
LARAMIE
SALT LAKE CITY
RENO
DENVER
SAN FRANCISCO
LEGEND
(1910) PINE INFECTION AND YEAR OF ORIGIN
(1952) RIBES INFECTION AND YEAR FOUND
BOUNDARY OF INFECTION ON PINE
BOUNDARY OF INFECTION ON RIBES
WHITE PINE
STATE LINES
TRACED FROM BLISTER RUST
CONTROL MAPS DECEMBER 1952
GYNN

14. Q. WHEN WAS THE DISEASE DISCOVERED IN CALIFORNIA?

A. It was found in California on sugar pine in Del Norte County in June 1936, one and one half miles south of the California-Oregon state line, and is believed to have been present there since 1929.

15. Q. HOW FAR SOUTH HAS THE RUST SPREAD?

A. From Vancouver, British Columbia, the point where it first became established in the West, the rust has spread southward through the coastal region of Washington and Oregon into California. There was a general spread southward in California in 1937 and 1938 when blister rust was found on ribes about 125 miles south of the Oregon border in the Coast Range and 160 miles in the Sierra Nevada. By 1953 rust-infected sugar pines had been found at various points in the Sierra Nevada as far south as the Stanislaus National Forest northeast of Sonora, near Strawberry Lake. The discovery on the Stanislaus extended the known location of infection to 264 miles south of the Oregon border. The finding of rust on ribes in western San Mateo County extended the known limit of the disease in the Coast Range to a point 310 miles south. All this indicates that blister rust has established itself in the sugar pine stands of both the Sierra Nevada and the Coast Range of California

16. Q. WERE ANY MEASURES TAKEN TO PREVENT ITS RAPID SPREAD TO THE COMMERCIAL SUGAR PINE BELTS?

A. Yes, these delay measures were twofold:

1. Quarantine laws were enforced prohibiting the shipment of pines and ribes from infected to non-infected areas.

2. After the discovery of the rust in the West, the highly susceptible cultivated black currant, which becomes infected at long distances from diseased white pines, was largely eradicated from Montana, Idaho, Washington, Oregon, and California. This currant is an important agent in the long distance spread and local establishment of the rust.

17. Q. WERE THESE DELAY MEASURES EFFECTIVE?

A. Yes. The quarantine laws ensure that infected host plants will not be shipped to disease-free areas. They are still in effect. The eradication of the cultivated black currant has undoubtedly helped to delay the rapid spread of the disease. This species of currant is the most susceptible to the rust and has been found infected at points over 300 miles from white pines.

Currants and gooseberries are searched for and uprooted by hand labor on areas of light concentrations. A crewman is shown here uprooting a gooseberry bush by means of a pick mattock.

Toxic chemicals are sprayed on currants and gooseberries where these bushes occur in dense concentrations. Using a back-pack sprayer, a solution of 2,4,5-T is used to kill a large bush.

Seen from the rim of an ancient volcano's crater, beautiful Crater Lake attracts tourists from all parts of the nation. Rugged high-altitude white bark pine adds to the scenic values of such recreational areas.

Picnic areas in Yosemite National Park, shaded by giant sugar pines attract hundreds of thousands of tourists from other states each year. Blister rust control in such areas will perpetuate their usefulness by preserving these majestic trees.

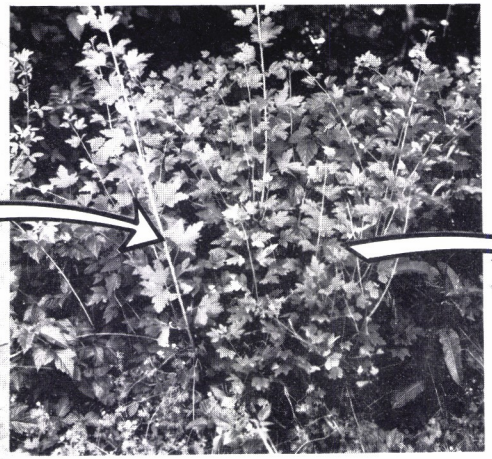
white pine blister rust. It gives the Secretary of Agriculture authority to use appropriated Federal funds for the protection of white pine on Federal and other lands, irrespective of ownership when in his judgment work on those lands is necessary. Also, it authorizes him to use appropriated funds for blister rust control where no Federal lands are involved, when equal sums are made available by State, county, or other local agencies, or by the individual owner. This establishes a practical basis for cooperative blister rust control work on state and private lands whereby states and private timber owners may join the Federal Government in sharing the responsibility for protection of non-Federal pine stands.

33. Q. WHAT PART HAS THE STATE OF CALIFORNIA PLAYED IN FINANCING THE BLISTER RUST CONTROL PROGRAM IN CALIFORNIA?

A. The State of California has played a dominant role in making blister rust control possible on state and private lands. Commencing in 1941 and annually thereafter, State-appropriated funds in substantial amounts have been available for the continuance of control measures. These funds were matched with Federal funds and the total sums thus made available were used for cooperative control work on state and private lands. The control work on national forests, national parks, and Bureau of Land Management lands is administered by the respective agencies concerned.

HOW BLISTER RUST SPREADS

FROM DESEASED SUGAR PINES IN THE SPRING SPORES ARE WINDBORNE AS FAR AS 300 MILES...
(APRIL-MAY-JUNE)



TO CURRANT AND GOOSEBERRY BUSHES (RIBES), WHERE FURTHER DEVELOPMENT AND INTENSIFICATION TAKES PLACE.
(JUNE TO OCTOBER)

THE FALL SPORES DEVELOPED ON THE RIBES LEAVES ARE CARRIED BY THE WINDS ABOUT 1,000 FEET ...
(JULY-AUGUST-SEPTEMBER)

TO HEALTHY PINES. THE SPORES ENTER THROUGH A NEEDLE AND SPREAD TO THE TRUNK, EVENTUALLY KILLING THE TREE.

ERADICATION OF THESE BUSHES WILL BREAK THE LIFE CYCLE OF BLISTER RUST AT THIS STAGE AND EFFECTIVELY CONTROL THE DESEASE.